R16

SET - 1

III B. Tech I Semester Regular Examinations, October/November - 2018
ENGINEERING GEOLOGY
(Civil Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
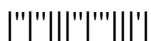3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1.	a)	Define the term geology.	[2M]
	b)	What is meant by specific gravity?	[2M]
	c)	What is meant by strike?	[2M]
	d)	What are pellicular waters? Where it occurs?	[3M]
	e)	What are the parameters of electrical methods?	[3M]
	f)	What is the importance of over break?	[2M]

PART -B

2.	a)	What are the branches of geology with reference to civil engineering?	[7M]
	b)	Explain the geological works of rivers.	[7M]
3.	a)	What are the common structures of sedimentary rocks?	[7M]
	b)	Distinguish between i) shale and slate ii) limestone and marble iii) granite and quartzite	[7M]
4.	a)	What are the parts of joints? Give their types.	[7M]
	b)	What are the parts uniformities? Give their types.	[7M]
5.	a)	Explain the classification of rocks based on porosity and permeability.	[7M]
	b)	Describe the ground water exploration techniques.	[7M]
6.	a)	What are the principles of exploration geophysics?	[7M]
	b)	What are principle, parameter and methods of gravity method?	[7M]
7.	a)	What are the types of dams and give their purpose?	[7M]
	b)	Explain the influence of rock types for successful construction of dams.	[7M]

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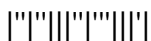3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1.	a)	Define the term structural geology.	[2M]
	b)	What is meant by fracture?	[2M]
	c)	What is meant by dip?	[2M]
	d)	What are types of waves?	[3M]
	e)	What is the principle of magnetic methods?	[3M]
	f)	Draw the top view of buttress dam?	[2M]

PART –B

2.	a)	What are the physical parameters of weathering process?	[7M]
	b)	Explain the development of river and valley development.	[7M]
3.	a)	What are the forms of igneous rocks?	[7M]
	b)	Explain the classification and structures of igneous rocks.	[7M]
4.	a)	What are the parts of folds? Give their mechanism of folding.	[7M]
	b)	Explain the types of folds with sketches.	[7M]
5.	a)	What are landslides? Explain the internal causes of landslides.	[7M]
	b)	Enumerate the classification of earth movements.	[7M]
6.	a)	What is the importance of geo physical investigations?	[7M]
	b)	What are the controlling properties, principle and methods of electromagnetic method?	[7M]
7.	a)	What is life of reservoir?	[7M]
	b)	Explain the influence of geological structure for successful reservoirs.	[7M]

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III B. Tech I Semester Regular Examinations, October/November - 2018
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PART –A

1.	a)	Define petrology.	[2M]
	b)	What is meant by cleavage?	[2M]
	c)	What is meant by fault plane?	[2M]
	d)	What is meant by unconfined water?	[3M]
	e)	What are the parameters of gravity methods?	[3M]
	f)	What is the capacity of the reservoir?	[2M]

PART -B

2.	a)	What is the role of atmosphere in weathering, erosion and denudation?	[7M]
	b)	What are the chemical and biological parameters of weathering process?	[7M]
3.	a)	What are the methods of study of minerals?	[7M]
	b)	Explain the different typical forms in identification of minerals.	[7M]
4.	a)	What are the parts of faults? Give their mechanism of faulting.	[7M]
	b)	Explain the types of faults with sketches.	[7M]
5.	a)	What is meant by earthquake and their effects in structures?	[7M]
	b)	What are the preventive measures taken in the construction of building in earthquake prone areas?	[7M]
6.	a)	What are the factors influencing of electrical resistivity?	[7M]
	b)	What are the different types of electrical resistive methods?	[7M]
7.	a)	What is the purpose and lining of tunneling?	[7M]
	b)	Explain the importance of geological structures for successful tunneling.	[7M]

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R16

SET - 4

III B. Tech I Semester Regular Examinations, October/November - 2018
ENGINEERING GEOLOGY
(Civil Engineering)

Time: 3 hours   Max. Marks: 70

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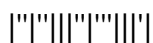3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1.	a)	Define the term economic geology.	[2M]
	b)	What is meant by streak?	[2M]
	c)	What is meant by unconformity?	[2M]
	d)	What is meant by earth movements?	[3M]
	e)	What are the parameters of geo thermal methods?	[3M]
	f)	What are the effects of tunneling?	[2M]

PART -B

2.	a)	What are the geological agents?	[7M]
	b)	Explain the role of importance of geology in civil engineering.	[7M]
3.	a)	What is the mode of formation of minerals?	[7M]
	b)	Write the physical properties of quartz group of mineral.	[7M]
4.	a)	Draw the sketches and parts of anticline, syncline, isoclinal, drag, dome and basin of folds.	[7M]
	b)	What are the conformable and unconformable beds? Give their mechanism.	[7M]
5.	a)	What is meant by porosity and permeability?	[7M]
	b)	What is water table? Give their types of ground water.	[7M]
6.	a)	What is the importance of engineering geo physics	[7M]
	b)	What are the principles, methods of seismic refraction method?	[7M]
7.	a)	What are the competent rocks for safe foundation of dams?	[7M]
	b)	Write the importance of ground water condition for tunneling.	[7M]

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Code No: R1631023   R16   SET - 1

III B. Tech I Semester Regular Examinations, October/November - 2018
SIGNALS AND SYSTEMS
(Electrical and Electronics Engineering)
Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
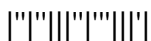3. Answer any **FOUR** Questions from **Part-B**
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PART –A

1. a) What is the condition for orthonormality?   [2M]

    b) If $x(t) \overset{F}{\leftrightarrow} X(f)$, then find FT of $g(t) = x(2t)$.   [2M]

    c) What is the minimum sampling rate required to sample the signal   [2M]
        $x(t) = 5\cos(\pi 500t) + 15\sin(\pi 1000t)$

    d) Draw the magnitude response of ideal band stop filter.   [3M]

    e) What is the relation between Laplace transform and Fourier transform of a signal?   [3M]

    f) Find the z-transform of $x[n] = \left(\frac{1}{4}\right)^n u(-n-1)$?   [2M]
PART -B

2. a) Find the even and odd parts of the signal shown in Figure.   [7M]

    b) Show that the unit impulse function is the derivative of unit step function.   [7M]

3. a) State and prove the time-convolution property of Fourier transform.   [7M]

    b) A periodic signal is defined over one period as   [7M]
        $$x_p(t) = \sin(\pi t) ; 0 < t < 1$$
        i) Plot $x_p(t)$
        ii) Obtain Fourier series representation of $x_p(t)$

4   State and prove sampling theorem for band-limited signals.   [14M]

5. a) State and prove Parseval's theorem.   [7M]

    b) Find the convolution of two signals $x(t) = u(t-1) - u(t+1)$ and   [7M]
        $h(t) = e^{-at}u(t), a > 0$.

6. a) Find the Laplace transform of $x(t) = e^{-at}u(t), a > 0$ and plot its ROC.   [7M]
    b) State and prove the convolution property of Laplace transform.   [7M]

7. a) State and prove the final-value theorem of z-transform.   [7M]
    b) Find the inverse z-transform of $X(z) = \frac{1}{1+z}$ with ROC $|z| < 1$.   [7M]
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III B. Tech I Semester Regular Examinations, October/November - 2018
SIGNALS AND SYSTEMS
(Electrical and Electronics Engineering)

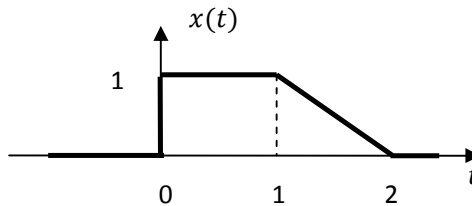Time: 3 hours   Max. Marks: 70

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2. Answer **ALL** the question in **Part-A**
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PART –A

1. a) If it is periodic, what is the fundamental period of   [2M]
   $x(t) = A\cos(2\pi 1000t) + B\sin(2\pi 500t)$?
   b) Find the FT of unit ramp function.   [2M]
   c) What is aliasing effect?   [2M]
   d) Define cross-correlation function.   [3M]
   e) Find the initial value of $x(t)$ with $X(s) = \frac{1}{s+1}$.   [3M]
   f) State final-value theorem of z-transform.   [2M]

PART -B

2. a) Define the following: [7M]
   i) Energy-type signals   ii) Power-type signals
   b) If $x(t) = u(t) - u(t - 1)$. Plot $y(t) = x(2t + 3)$.   [7M]

3. a) State and prove the time-scaling property of Fourier transform.   [7M]
   b) Explain how the Fourier transform of a periodic signal can be obtained.   [7M]

4. a) Define the following: [7M]
   i) Sampling rate   ii) Under Sampling   iii) Nyquist interval
   b) Determine the conditions on sampling interval T_s, so that the signal   [7M]
   $x(t) = cos(2\pi t) + \sin(6\pi t)$ is uniquely represented by a discrete-time
   sequence $x[n] = x(nT_s)$.

5. a) Explain about stability and causality of an LTI system.   [7M]
   b) What do you understand by distortedness transmission? Explain.   [7M]

6. a) State and prove the initial-value theorem of Laplace transform.   [7M]
   b) Determine the Laplace transform of the following signals: [7M]
   i) $x_1(t) = \cos(\omega_o t)$ ii) $x_2(t) = te^{-t}u(t)$

7. a) State and prove time convolution property of Z-transform.   [7M]
   b) Determine z-transform, ROC and pole-zero locations of $x[n] = e^{j\Omega_o n}u[n]$.   [7M]

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III B. Tech I Semester Regular Examinations, October/November - 2018
SIGNALS AND SYSTEMS
(Electrical and Electronics Engineering)

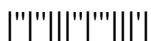Time: 3 hours　　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 70

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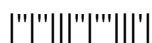3. Answer any **FOUR** Questions from **Part-B**
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PART –A

1. a) Evaluate the integral: $\int_{-\infty}^{\infty} \cos(200t)\delta(t - t_o)dt$ [2M]

　　b) State the time-integration property of FT.   [2M]

　　c) Define Nyquist interval.   [2M]

　　d) What is the relation between rise time and bandwidth of a linear system?   [3M]

　　e) Find the final value of $f(t)$ with $F(s) = \frac{10}{s+10}$.   [3M]

　　f) Draw the ROC of $X(z)$ if $x[n] = \left(\frac{1}{8}\right)^n u[n]$.   [2M]

PART -B

2. a) Define the following and give one example for each: [7M]
　　　　i) Random signal　　ii) Deterministic signal　　iii)Multi channel signal
　　b) Determine whether the signal $x(t) = (\cos(2\pi t))^2$ is periodic. If it is periodic, find the fundamental period.   [7M]

3. a) Use differentiation-in-time and differentiation-in-frequency properties to find the Fourier transform of the Gaussian pulse, $(t) = \left(\frac{1}{\sqrt{2\pi}}\right)e^{-\frac{t^2}{2}}$.   [7M]
　　b) Find the Hilbert transform of the signal $x(t) = \cos(2\pi t)$.   [7M]

4. a) Define the following: [7M]
　　　　i) Under sampling　　ii) Over sampling　　iii) Critical sampling
　　b) Compare natural sampling and flat top sampling.   [7M]

5. a) A signal is given by $x(t) = u(t) - u(t - 1)$. Convolve $x(t)$ with itself and plot the result.   [7M]
　　b) Draw the ideal filter characteristics. What is the condition for realizability of these filters?   [7M]

6. a) Find the inverse Laplace transform of   [7M]
　　　　i) $X(s) = \frac{1}{s+2}$ with ROC $Re(s) > -2$
　　　　ii) $X(s) = \frac{1}{(s+2)(s+3)}$ with ROC $Re(s) > -2$
　　b) List the properties of ROC for Laplace transforms   [7M]

7. a) State and prove the convolution property of z-transform.   [7M]
　　b) State and prove time-advance property of z-transform.   [7M]

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III B. Tech I Semester Regular Examinations, October/November - 2018
SIGNALS AND SYSTEMS
(Electrical and Electronics Engineering)

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PART –A

1. a) Plot the signal $x(t) = 5u(2t - 1)$, where $u(t)$ is unit step function.   [2M]

   b) Define Fourier complex spectrum   [2M]

   c) Define band-limited signal.   [2M]

   d) What is the relation between convolution and correlation?   [3M]

   e) State differentiation property of Laplace transforms.   [3M]

   f) Draw the pole-zero plot of $H(z) = \frac{z}{1+z}$ [2M]

PART -B

2. a) Find the energy and power of the signal $x(t) = 5\cos(\pi t) + \sin(5\pi t)$.   [7M]

   b) Explain how signals can be approximated using orthogonal functions.   [7M]

3. a) Find the Fourier transform of signum function and plot its spectrum.   [7M]

   b) Derive the relation between exponential Fourier coefficients and trigonometric Fourier coefficients.   [7M]

4. a) Explain how a band-limited signal can be reconstructed from its samples.   [7M]

   b) Write notes on flat-top sampling.   [7M]

5. a) Define the following: [7M]
   i) Signal bandwidth   ii) System bandwidth   iii) Causality of a filter

   b) State all the properties of Auto correlation function.   [7M]

6. a) State and prove the final-value theorem of Laplace transform.   [7M]

   b) Find the Laplace transform and ROC of $x(t) = sgn(t) + e^{-2t}u(t) + u(t)$.   [7M]

7. a) Find the inverse z-transform of $X(z) = \frac{1}{1-az^{-1}}$ with ROC $|z| < |a|$ [7M]

   b) State and prove the differentiation in z property of z-transform.   [7M]
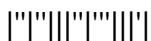
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Code No: R1631034   **R16**   SET - 1

III B. Tech I Semester Regular Examinations, October/November - 2018
OPERATIONS RESEARCH
(Mechanical Engineering)

Time: 3 hours   Max. Marks: 70

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PART – A

1	a)	Write the classification of OR models.	[2M]
	b)	Explain the use of vogel's approximate method?	[3M]
	c)	Explain replacement situations giving an example for each of them.	[2M]
	d)	What is a rectangular game? Define pure strategy and mixed strategy in a game.	[2M]
	e)	What are the types of inventory?	[2M]
	f)	What is meant by Monte Carlo simulation?	[3M]

PART – B

2   What do you mean by LPP? What are its limitations? Use penalty (or Big-M) method   [14M]
to maximize $z = 3x_1 - x_2$
Subject to the constraints
$2x_1 + x_2 \geq 2$; $x_1 + 3x_2 \leq 3$; $x_2 \leq 4$ $x_1, x_2 \geq 0$.

3   a)   Find the optimum solution to the transportation problem given in the Table for which   [7M]
the cost, origin-availabilities, and destination-requirements are given.

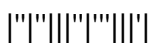|	D1	D2	D3	D4	Supply
O1	5	3	6	2	19
O2	4	7	9	1	37
O3	3	4	7	5	34
Demand	16	18	31	25	90

    b)   Six jobs go first over Machine-I and then over Machine-II. The orders of completion   [7M]
of jobs have no significance. The following gives the machine times in hours for six
jobs and the two machines.
Find the

Job	**1**	**2**	**3**	**4**	**5**	**6**
Machine I	5	9	4	7	8	6
Machine II	7	4	8	3	9	5

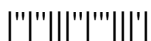Optimal total time and the idle times of the machine.

4   a)   Find the cost period of individual replacement of an installation of 300 lighting bulbs,   [7M]
given the following:
i) Cost of replacing individual bulb is Rs. 3
ii) Conditional probability of failure is given below:

Week number:	0	1	2	3	4
Conditional probability of failure :	0	1/10	1/3	2/3	0

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b)   Explain the replacement procedure for the items that deteriorate with time with an example.   [7M]

5   a)   Solve the following game graphically.   [7M]

	Player B	
	1	2
	5	4
Play	-7	9
er A	-4	-3
	2	1

b)   Write the assumptions made in game theory.   [7M]

6   a)   A manufacturer purchases items in lots 0f 800 units which is a four months requirement. The cost per unit is Rs. 100 and the ordering cost is Rs. 120 per patch order. The inventory carrying cost is estimated as 20% of the average inventory investment. i) Determine the annual variable cost managing the inventory. ii) How much saving can be obtained from the EOQ purchases?   [8M]

b)   Describe the EOQ problem with one price break.   [6M]

7   a)   Explain the principal features of simulation languages.   [6M]

b)   Apply Dynamic programming to Max $Z = 2x_1 + 3x_2$ [8M]
$$\text{subjected to } x_1 + 2x_2 \leq 4$$
$$2x_1 + x_2 \leq 3 \text{ and } x_1, x_2 \geq 0$$

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Code No: R1631034

R16

SET - 2

III B. Tech I Semester Regular Examinations, October/November - 2018
OPERATIONS RESEARCH
(Mechanical Engineering)

Time: 3 hours   Max. Marks: 70

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PART – A

1 a) What are the limitations of LP problem?   [2M]
   b) Give the mathematical formulation of an assignment problem   [3M]
   c) Discuss briefly the various types of replacement problems.   [2M]
   d) Give some important applications of queuing theory in industries.   [2M]
   e) Describe the basic characteristics of an inventory system.   [3M]
   f) Distinguish between mathematical models and simulation models.   [2M]

PART – B

2   Maximize $Z=5x_1-4x_2+3x_3$ Subject to   [14M]
$$2x_1+x_2-6x_3= 20$$
$$6x_1+5x_2+10x_3 \leq 76$$
$$8x_1-3x_2+6x_3 \leq 50$$
$$x_1, x_2, x_3 \geq 0$$

3 a) Briefly explain the Hungarian Method procedure with example. Also write the assumptions.   [8M]
   b) What is degeneracy? How do you overcome degeneracy in transportation problems?   [6M]

4 a) A machine owner finds from his past records that the costs per year of maintaining a machine whose purchase price is Rs. 6000/- are as given below.   [7M]

Year	1	2	3	4	5	6	7	8
Maintenance cost	1000	1200	1400	1800	2300	2800	3400	4000
Resale price	3000	1500	750	375	200	200	200	200

Determine at what age a replacement is due.
   b) Briefly explain what you mean by "individual and group replacement policy".   [7M]

5 a) In a game matching coins with two players suppose A wins one unit of value when there are two heads, wins nothing when there are two tails and losses ½ unit of value when there are one head and one tail. Determine the payoff matrix, the best strategies for each player and the value of game to A.   [7M]

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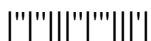
b) Solve the following game using dominance principle.   [7M]

	Player B			
	1	**2**	**3**	**4**
I	19	6	7	5
II	7	3	14	6
III	12	8	18	4
IV	8	7	13	-1

Player A is labelled to the left of rows I–IV.

6 a) What are costs that are involved in carrying inventory? Explain them in detail.   [7M]

b) A small firm producing automobile brake linings estimates the steel requirements for the next year's production at 6000 Kg. The cost of carrying steel in inventories works out to Rs 1 per Kg. per month. The cost of ordering works out at Rs 100 per order. If the cost per kg of steel is Rs 100, find out the economic order quantity, the number of orders per year, and total cost incurred by the firm for one year.   [7M]

7 A. distance network consists of eleven nodes which are distributed as shown in figure 1. Find the shortest path from node 1 to node 11 and also the corresponding distances.   [14M]
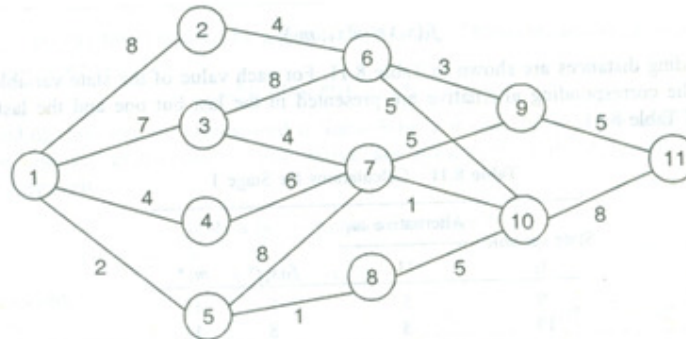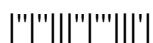

Figure .1 Distance network.

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III B. Tech I Semester Regular Examinations, October/November - 2018
OPERATIONS RESEARCH
(Mechanical Engineering)

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PART – A

1. a) What is its significance in simplex method of solving LPP?   [2M]
   b) Give the mathematical formulation of transportation problem.   [2M]
   c) Explain the methodology of solving replacement problems.   [2M]
   d) What is a rectangular game?   [2M]
   e) Derive the mathematical equation for EOQ. What are the assumptions involved?   [3M]
   f) What is dynamic programming?   [3M]

PART – B

2. a) A company is manufacturing two different types of products, A and B. Each product has to be processes on two machines M_1 and M_2, Product A requires 2 hours on machine M_1 and 1 hour on machine M_2, product B requires 1 hour on machine M_1 and 2 hours on machine M_2. The available capacity of machine M_1 is 104 hours and that of machine M_2 is 76 hours. Profit per unit for product A is Rs.6 and that for B is Rs.11. Calculate i) Formulate the problem ii) Find out the optimal solution by Simplex method.   [8M]

   b) Briefly explain the applications of Operation Research.   [6M]

3. a) What is sequencing problem? Explain the following terms in context of sequence problems: i) Total elapsed time and Idle time ii) no passing rule iii) processing order.   [8M]

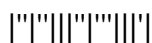   b) Write the LP formulation of a transportation problem.   [6M]

4. The failure rates of 1000 street bulbs in a colony are summarized in following table   [14M]

Failure Rates of Street Bulbs

End of month	1	2	3	4	5	6
Probability of failure to date	0.05	0.20	0.40	0.65	0.85	1.00

The cost of replacing an individual bulb is Rs.60. If all the bulbs are replaced simultaneously it would cost Rs. 25 per bulb. Any one of the following two options can be followed to replace the bulbs.
i) Replace the bulbs individually when they fail (individual replacement policy).
ii) Replace all the bulbs simultaneously at fixed intervals and replace the individual bulbs as and when they fail in service during the fixed interval (group replacement policy). Find out the optimal replacement policy, i.e. individual replacement policy or group replacement policy If group replacement policy is optimal, then find at what equal intervals should all the bulbs be replaced?

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5　a)　The payoff matrix of a game is given. Find the solution of the game to the player A　　[7M]
　　and B.

	Player B				
		I	II	III	IV	V

		I	II	III	IV	V
	I	-2	0	0	5	3
Player A	II	3	2	1	2	2
	III	-4	-3	0	-2	6
	IV	5	3	-4	2	-6

　b)　Explain the theory of dominance in the solution of rectangular games.　　[7M]

6　Determine a decision rule using the basic purchasing EOQ model for annual demand　　[14M]
　of 20,000 units, ordering cost of Rs.200 per order and carrying cost of 10% per year.
　The basic price is Rs.8.00 per unit. This price is in effect of all orders of less than
　5000 units. Orders for 5000 or more but less than 10000 units may be purchased for
　Rs.7.50 per unit. Orders for 10000 or more units may be purchased for Rs.7.25 per
　unit.

7　a)　Discuss the types of simulation models.　　[7M]
　b)　Solve the following problem by using dynamic programming:　　[7M]
$$\text{Max. } Z = 2x_1 + 9x_2$$
$$\text{subject to}$$
$$2x_1 + x_2 \le 25$$
$$x_2 \le 11$$
$$x_1, x_2 \ge 0.$$

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2 of 2

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R16

III B. Tech I Semester Regular Examinations, October/November - 2018
OPERATIONS RESEARCH
(Mechanical Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
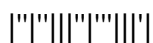3. Answer any **FOUR** Questions from **Part-B**
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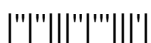
PART – A

1 a)	State the general linear programming problem (LPP) and put it in the standard form.	[3M]
b)	What is meant by an optimality test in a transportation problem?	[2M]
c)	What are the situations which make the replacement of items necessary?	[2M]
d)	Name a few applications of queuing in mechanical engineering.	[2M]
e)	Explain the significance of EOQ.	[2M]
f)	What are the demerits of dynamic programming?	[3M]

PART – B

2 a) Old hens can be bought at Rs 30 each and young ones at Rs 50 each. The old hens   [7M]
lay 3 eggs per week and the young ones lay 6 eggs per week, each egg being worth
Rs.1.75 paise. A hen (young or old) costs Rs 3 per week to feed. I have only
Rs. 100 to spend for hens. How many of each kind should I buy to give a profit of
more than Rs 6 per week, assuming that I cannot house more than 20 hens?

b) Minimize $Z = x_1 - 3x_2 + 2x_3$,   [7M]
   Subject to: $3x_1 - x_2 + 3x_3 \leq 7$
                 $-2x_1 + 4x_2 \leq 12$
                 $-4x_1 + 3x_2 + 8x_3 \leq 10$, and $x_1, x_2, x_3 \geq 0$ Solve the problem
by using simplex method.

3   Consider the problem of assigning five operators to five machines. The assignment   [14M]
costs are given in below table.

	M_1	M_2	M_3	M_4	M_5
A	7	7	-	4	8
B	9	6	4	5	6
C	11	5	7	-	5
D	9	4	8	9	4
E	8	7	9	11	11

Operator A cannot be assigned to machine M_3 and operator C cannot be assigned to
machine M_4. Find the optimum assignment schedule.

4 a) Alpha Castings Private Limited, a small scale industry purchases a generator for   [7M]
Rs. 20,000. The operation cost is Rs. 2000 during the first year of its operation and
it increases by Rs. 1000 every year thereafter. The maintenance cost is Rs. 200
during the first year of its operation and it increases by Rs. 100 every year
thereafter. The purchase of this generator is through an interest free loan sanctioned
for this company by Small Scale Industrial Development Corporation. Find the
economic life of the generator.

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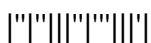
b) The initial cost of an item is Rs.20,000 and maintenance and running cost (in Rs) for different years are given below: [7M]

Year	1	2	3	4	5	6	7
Running Cost	3000	3500	4500	5500	6500	8500	10500

What is the replacement policy to be adopted If the capital worth is 15% and there is no salvage value?

5 a) Solve the following game using dominance principle. [8M]

		Player B			
		1	2	3	4
Player A	I	19	6	7	5
	II	7	3	14	6
	III	12	8	18	4
	IV	8	7	13	-1

b) Explain the following: (i) Saddle point (ii) Two-person zero -sum game. [6M]

6 a) Annual demand for an item is 6000 units. Ordering cost is Rs. 600 per order. Inventory carrying cost is 18% of the purchase price/unit/year. The price breakups are as shown below. [7M]

Quantity	Price (in Rs.) Per unit
$0 \le Q_1 < 2000$	20
$2000 \le Q_2 < 4000$	15
$4000 \le Q_3$	9

Find the optimal order size.

b) Derive the mathematical equation for EOQ. What are the assumptions involved? [7M]

7 a) Solve the following linear programming problem by dynamic programming approach. Maximize $Z= 2x_1+5x_2$, [10M]

Subject to the constraints
$$2x_1+x_2 \le 43$$
$$2x_2 \le 46$$
$$x_1 \ge 0 , x_2 \ge 0.$$

b) Explain briefly the advantages and the disadvantages of simulation. [4M]

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III B. Tech I Semester Regular Examinations, October/November - 2018
DIGITAL IC APPLICATIONS
(Common to Electronics Communication Engineering and Electronics Instrumentation Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
        2. Answer **ALL** the question in **Part-A**
        3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1.	a)	What are the advantages and disadvantages of CMOS technology?	[2M]
	b)	Give the program structure.	[2M]
	c)	What is the difference between if and case statement.	[2M]
	d)	Write a VHDL program for 4x1 multiplexer.	[3M]
	e)	What is the difference between Ring Counter and Twisted ring counter?	[3M]
	f)	Explain the significance of State Reduction.	[2M]

PART -B

2.	a)	Explain the terms i) DC noise margin ii) Fan-out with reference to TTL gate.	[7M]
	b)	Design CMOS transistor circuit for 3-input AND gate. With the help of function Tables explain the operation of the circuit diagram.	[7M]
3.	a)	Explain the structure of various LOOP statements in VHDL with examples.	[7M]
	b)	Explain the difference in program structure of VHDL and any other procedural language. Give an example.	[7M]
4.	a)	Design a 2 to 4 decoder circuit. Give its entity declaration behavioural model. Also draw the waveform giving relation between its inputs and outputs.	[7M]
	b)	Explain about variable assignment statement, signal assignment statement, wait statement.	[7M]
5.	a)	Design a 24-bit comparator circuit using 74×682 ICs and explain the functionality of the circuit. Also implement VHDL source code in data flow style.	[7M]
	b)	Design and implement counter using VHDL which counts up to 9 and down counts again from 9 to 0.	[7M]
6.	a)	Design a conversion circuit to convert a D flip-flop to J-K flip-flop. Write data-flow style VHDL program.	[7M]
	b)	Draw the circuit of a bidirectional shift register with parallel loading using 2 to 4 line decoder and D-flip-flops.	[7M]
7.	a)	What is meant by finite state machine? What are the capabilities and limitations of finite state machine?	[7M]
	b)	Write short notes on the following with suitable examples. i)State diagram ii)State table iii)state assignment	[7M]

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III B. Tech I Semester Regular Examinations, October/November - 2018
DIGITAL IC APPLICATIONS
(Common to Electronics Communication Engineering and Electronics Instrumentation Engineering)

Time: 3 hours   Max. Marks: 70

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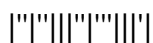3. Answer any **FOUR** Questions from **Part-B**
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PART –A

1. a) Give the logic levels of CMOS and TTL families. [2M]
   b) What is Enumeration data type in VHDL? Give examples. [2M]
   c) Define and explain Loop statement. [2M]
   d) Write a VHDL program for 1 x 4 demultiplexer. [3M]
   e) Distinguish between Synchronous Counters and Asynchronous Counters. [3M]
   f) Define the terms State diagram and state table. [2M]

PART -B

2. a) Draw the dynamic electrical behaviour of CMOS inverter and explain. [7M]
   b) Explain the differences between TTL, ECL & CMOS logic family. [7M]

3. a) Discuss the binding? Discuss the binding between entity and components. [7M]
   b) Write a process based VHDL program for the prime-number detector of 4-bit input and explain the flow using logic circuit. [7M]

4. a) Discuss Inertial Delay Model? [7M]
   b) Explain the concept of internal logic synthesizer and also draw the schematic. [7M]

5. a) With the help of logic diagram explain 74×157 multiplexer. Write the data flow Style VHDL program for this IC? [7M]
   b) Explain about Comparator and design a 16-bit comparator using 74×85 IC's. Write VHDL program. [7M]

6. a) Explain how a JK- flip-flop can be constructed using a T- flip-flop. [7M]
   b) Write down truth table, VHDL Code for the 4 bit register with parallel load. Also draw the circuit and output waveform. [7M]

7. a) Explain the minimization of completely specified sequential machines. [7M]
   b) Convert the following melay machine into a corresponding Moore machine. [7M]

P.S	NS,X=0	Z, X=1
A	B,0	E,0
B	E,0	D,0
C	D,1	A,0
D	C,1	E,0
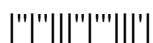
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III B. Tech I Semester Regular Examinations, October/November - 2018
DIGITAL IC APPLICATIONS
(**Common to** Electronics Communication Engineering and Electronics Instrumentation Engineering)

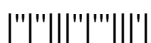Time: 3 hours   Max. Marks: 70

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PART –A

1.	a)	Give the logic levels and noise margins of TTL families.	[2M]
	b)	Write a VHDL program for 2x4 Decoder.	[2M]
	c)	Define and explain Next statement.	[2M]
	d)	Explain about Barrel Shifter.	[3M]
	e)	List the various IC versions of shift registers.	[3M]
	f)	What is One hot encoding?	[2M]

PART -B

2.	a)	Explain the effect of floating inputs on CMOS gate.	[7M]
	b)	Draw the circuit diagram of basic TTL NAND gate and explain the three parts with the help of functional operation.	[7M]
3.	a)	Explain about dataflow design elements of VHDL.	[7M]
	b)	Write a VHDL program for comparing 8 bit unsigned integers.	[7M]
4.	a)	With examples explain the sequential assignment statements.	[7M]
	b)	Discuss Transport Delay Model.	[7M]
5.	a)	Draw the circuit of a 4-bit ripple carry adder circuit and explain how it is different from look-a-head carry circuit. Give the equation for C_1 to C_4 for a look-ahead carry adder circuit.	[7M]
	b)	Design a 4 to 16 decoder using two 74×138 decoders.	[7M]
6.	a)	Write down the VHDL code of S-R flip flop.	[7M]
	b)	Give a VHDL code for a 4-bit up counter with enable and clear inputs.	[7M]
7.	a)	Draw the logic diagram of Melay model & explore its operation with examples.	[7M]
	b)	Write down the VHDL code for the serial adder.	[7M]

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III B. Tech I Semester Regular Examinations, October/November - 2018
DIGITAL IC APPLICATIONS
(**Common to** Electronics Communication Engineering and Electronics Instrumentation Engineering)

Time: 3 hours   Max. Marks: 70

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2. Answer **ALL** the question in **Part-A**
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PART –A

1.	a)	Explain the term Transition time with respect to CMOS logic.	[2M]
	b)	What are the operators available in VHDL?	[2M]
	c)	Define and explain assertion statement.	[2M]
	d)	Define three state devices.	[3M]
	e)	Write short note on Universal Shift Registers..	[3M]
	f)	Distinguish between Mealy and Moore Machines.	[2M]

PART -B

2.	a)	Design a CMOS transistor circuit for 3-input AND gate. With the help of function table explain the circuit.	[7M]
	b)	What is interfacing? Explain interfacing between low voltage TTL and low voltage CMOS logic.	[7M]
3.	a)	Explain about the following i) Packages with syntax ii) Libraries with syntax.	[7M]
	b)	What is the Significance of time dimension in VHDL? Explain its function.	[7M]
4.	a)	Explain about Inside of a logic synthesizer and Give its schematic.	[7M]
	b)	Discuss about Signal Drivers.	[7M]
5.	a)	Write a VHDL code for 4-bit Look ahead carry generator.	[7M]
	b)	Implement the 32 input to 5 output priority encoder using four 74LS148 & gates.	[7M]
6.	a)	Write down truth table, VHDL Code for the J-K flip flop using behavioural Modelling.	[7M]
	b)	Draw the circuit of MOD 16 Down ripple counter with D-flip-flops and explain its operation.	[7M]
7.	a)	Draw the logic diagram of Moore model & explore its operation with examples.	[7M]
	b)	Explain the minimization procedure for determining the set of equivalent state of a specified machine M.	[7M]
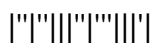
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R16

III B. Tech I Semester Regular Examinations, October/November - 2018
DATA BASE MANAGEMENT SYSTEMS
(Common to Computer Science Engineering, Information Technology)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1.	a)	Write the purpose of defining schema for an enterprise.	[2M]
	b)	Write the use of division operator in relational algebra.	[2M]
	c)	Write the differences between nested and correlated query.	[2M]
	d)	How dependency preservation can be achieved?	[3M]
	e)	Define durability and atomicity of a transaction.	[3M]
	f)	Write the significance of a clustered index.	[2M]

PART –B

2. a) Compare and contrast various Data Models.   [7M]
    b) Demonstrate data abstraction implementation in DBMS.   [7M]

3. a) Design a database for an airline. The database must keep track of customers and their reservations, flights and their status, seat assignments on individual flights, and [10M] the schedule and routing of future flights. Your design should include an E-R diagram, a set of relational schemas, and a list of constraints, including primary-key and foreign-key constraints.
    b) Discuss the representation of total participation and multivalued attribute in an E/R [4M] diagram.

4. a) Consider the SAILOR DATABASE   [10M]
    Sailors (sid:string, sname:string, rating:integer, age:real)
    Boats (bid:integer, bname:string, color:string)
    Reserves (sid:integer, bid:integer, day:date)
    Based on the above schema, write the corresponding SQL queries for the following?
    i) Find the colors of boats reserved by Lubber.
    ii) Find the names of sailors who have reserved at least one boat.
    iii) Find the names of sailors who have reserved a red or green boat.
    iv) Find the names of the sailors who have reserved both a Red boat and a Green boat.
    v) Find names of sailors who have reserved all boats.
    b) Write about the usability of 'group by' and 'having' clauses in SQL.   [4M]

5. a) Define functional dependency? How can you compute the minimal cover for a set of [7M] functional dependencies? Explain it with an example.
    b) Consider schema R = (A, B, C, G, H, I) and the set F of functional dependencies {A [7M] → B, A → C, CG → H, CG → I, B → H}. Compute the candidate keys of the schema. Compute the closure of the same.

1 of 2

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6. a) Explain Wait/Die and Wound/Wait Schemes in transaction management. [10M]
   b) Write the properties of a transaction. [4M]

7. a) What are the differences among primary, secondary and clustering indexes? How do these differences affect the ways in which these indexes are implemented? Which of the indexes are dense and which are not? [7M]
   b) Demonstrate the implementation of B+ trees. [7M]

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III B. Tech I Semester Regular Examinations, October/November - 2018
DATA BASE MANAGEMENT SYSTEMS
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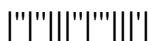Time: 3 hours   Max. Marks: 70

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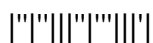
PART –A

1.	a)	Write the significance of data independence in DBMS design.	[2M]
	b)	List out the set operations specified in relational algebra?	[2M]
	c)	Write any two differences between Triggers and Integrity Constraints.	[2M]
	d)	What is lossless join? How it is achieved?	[3M]
	e)	Write the need of serializability in transaction management.	[3M]
	f)	Differentiate primary index from secondary index.	[2M]

PART –B

2.	a)	Explain the architecture of DBMS with a neat sketch.	[7M]
	b)	List out the functionalities of DBA.	[7M]
3.	a)	Construct an E-R diagram for a hospital with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examinations conducted.	[7M]
	b)	How do you represent cardinalities, roles, weak entities and weak relations in E/R diagram? Explain.	[7M]
4.	a)	Consider the Bank Management System.	[10M]

account(account_number, branch_name, balance)
branch (branch_name, branch_city, assets)
customer (customer_name customer_street, customer_city)
loan (loan_number, branch_name, amount)
depositor((customer_name, account_number)
borrower(customer_name, loan_number)
Based on the above schema, write the corresponding SQL queries for the following?
i) For all customers who have a loan from the bank, find their names, loan numbers, and loan amount.
ii) Find the customer names, loan numbers, and loan amounts, for all loans at the Perryridge branch.
iii) Find the names of all branches that have assets greater than those of at least one branch located in Brooklyn.
iv) Find the average account balance of those branches where the account balance is greater than Rs. 1200.
v) Find the maximum across all branches of the total balance at each branch.

	b)	Explain any four SQL Aggregate operators with an example.	[4M]

1 of 2

5. a) Explain the problems related to decomposition.   [7M]
    b) What is lossless join decomposition? Explain the same with an example.   [7M]

6. a) Explain two phase locking for ensuring serializability.   [9M]
    b) Discuss about view serializability.   [5M]

7. a) Can we have at most one primary or clustering index on a file, but several   [5 M]
        secondary indexes? Justify
    b) Demonstrate the implementation of B trees.   [9 M]

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III B. Tech I Semester Regular Examinations, October/November - 2018
DATA BASE MANAGEMENT SYSTEMS
(Common to Computer Science Engineering, Information Technology)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
          2. Answer **ALL** the question in **Part-A**
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PART –A

1.	a)	Discuss the use of data model in DBMS.	[2M]
	b)	Write the differences between foreign, candidate and super keys.	[2M]
	c)	List out set operators can be used in SQL?	[2M]
	d)	Define multivalued dependency.	[3M]
	e)	List out types of logs available in transition management? Differentiate them.	[3M]
	f)	Why indexing is needed in DBMS?	[2M]

PART –B

2.   a) Define data independence? How do you implement data independence in DBMS?   [7M]
           Explain

    b) Differentiate File systems from DBMS.   [7M]

3.   a) Consider the Bank Management System.   [10M]
        account(<u>account_number</u>, branch_name, balance)
        branch (<u>branch_name</u>, branch_city, assets)
        customer (<u>customer_name</u> customer_street, customer_city)
        loan (<u>loan_number</u>, branch_name, amount)
        depositor((customer_name, account_number)
        borrower(customer_name, loan_number)
        Answer the following queries using relational algebra operators.
        1. List all branch names and their assests
        2. List all accounts of Brooklyn branch
        3. List all loans with amount > 1000.
        4. List all accounts of Perryridge branch with balance < 1000.
        5. List Numbers of accounts with balances between 700 and 900

    b) Write the additional features of E/R Model.   [4M]

4.   a) Explain the operators in SQL with examples.   [8M]
        a)ANY b) IN c) EXISTS d) EXCEPT

    b) Explain nested queries and correlated queries with examples.   [6M]

5.   a) Explain BCNF and the properties of decompositions.   [9M]
    b) Write the properties of functional dependencies.   [5M]

6.   a) What is a transaction? Write the properties of a transaction.   [3M]
    b) Discuss the issues in handling concurrent transactions.   [4M]
    c) Explain how Concurrency control can be achieved with locking methods.   [7M]

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7. a) How does multilevel indexing improve the efficiency of searching an index file? [7M]
   b) Explain Hash-Based Indexing in detail. [7M]

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R16

III B. Tech I Semester Regular Examinations, October/November - 2018
DATA BASE MANAGEMENT SYSTEMS
(Common to Computer Science Engineering, Information Technology)

Time: 3 hours

Max. Marks: 70

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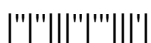3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1. a) Differentiate DDL from DML.   [2M]
    b) How does left outer join works?   [2M]
    c) List out any four constrains applied during creation of the table.   [2M]
    d) Write the importance of surrogate key.   [3M]
    e) What is the purpose of a check point? When Rollback is used?   [3M]
    f) Define clustered index.   [2M]

PART –B

2. a) Write any three data base applications with their functionalities.   [6M]
    b) Explain various data models in DBMS.   [8M]

3. a) Consider the following schema for company database   [10M]
        Employee (Name, ESSN, Salary, DNo, SuperSSN);
        Department(DName, DNos, MGRSSN);
        Project(PName, PNo, DNum);
        Works_ON(ESSN, PNo, Hours);
        Dependent(ESSN, DName, Sex);
        Write the queries in Relational Algebra
        i) List the name of employees with their dependants
        ii) Find the name of employees who work in department cse
        iii) Retrieve the name of managers, dept names with salaries.
        iv) Display the names of employees with their project names.
        v) Display the name of the employees with number of hours working.
    b) List out any four operations on relational algebra. Explain.   [4M]

4. a) Explain various types of Joins available in SQL with examples   [8M]
    b) Consider following relations and write SQL queries for given statements.   [6M]
        Assume suitable constrains.
        Instructor(ID, Name, Dept_name , Salary)
         Teaches(ID, Course_id, Sec_id, Semester(even/odd),Year)
        i) Find the average salary of the instructors in computer department.
        ii) Find the number of instructors in each department who teach a course in even
        semester of 2016.
        iii) Find the names of instructor with salary amounts between 30000 and 50000.

5. a) Explain FOURTH and THIRD normal forms with examples.   [7M]
    b) Elaborate the importance of computing closure of functional dependencies.   [7M]
        Explain the procedure with an example.

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6. a) Discuss about the implementation of atomicity and durability.   [7M]
    b) Explain two phase locking protocol.   [7M]

7. a) How does a B tree differ from a B+ tree? Why is a B+ tree usually preferred as an   [10M]
        access structure to a data file? Explain.
    b) How does multilevel indexing improve the efficiency of searching an index file?   [4M]

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III B. Tech I Semester Supplementary Examinations, October/November - 2018
TRANSPORTATION ENGINEERING – I
(Civil Engineering)

Time: 3 hours
Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
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PART –A

1	a)	What are urban roads? How are they classified?	[3M]
	b)	Write about horizontal transition curves?	[4M]
	c)	What are the factors affecting LOS?	[4M]
	d)	Compare various abrasion tests of aggregate.	[3M]
	e)	Write about wheel load stresses of rigid pavement.	[4M]
	f)	List various types of highway construction.	[4M]

PART -B

2	a)	Define Arterial, Sub-Arterial, collector & local streets?	[3M]
	b)	Give list of drawings to be submitted for highway alignment. Explain.	[8M]
	c)	What are various engineering surveys for highway alignment?	[5M]
3	a)	What are the steps involved to design super elevation?	[8M]
	b)	What is i) Kerb ii) Road Margin iii) Width of roadway iv) Right of way	[8M]
4	a)	How the traffic volume survey results are presented?	[8M]
	b)	Write about the causes of preventive measures of accidents.	[8M]
5	a)	List about tests in bitumen. Write about any two tests.	[8M]
	b)	Write about desirable properties aggregate.	[8M]
6	a)	Describe various functions of different components of flexible pavement.	[8M]
	b)	Determine spacing of contraction joints of 6.5 cm thick slab having 30 cm thickness and f=1.5 for the following cases.	[8M]

i) For plain cement concrete, allowable $Sc=0.6 \text{ kg/cm}^2$
ii) For reinforced cement concrete, 1cm diameter bars at 0.3 m spacing

7	a)	Discuss the various failures of flexible pavement.	[8M]
	b)	Write about various processes of pavement evaluation.	[8M]

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III B. Tech I Semester Supplementary Examinations, October/November -2018
POWER ELECTRONICS
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
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PART –A

| 1	a)	List out the different turn on methods of a SCR. Explain about temperature triggering.	[3M]
	b)	What type of gating signal is used in single phase AC voltage controller with RL load?	[4M]
	c)	What are the advantages of single phase bridge converter over single phase mid-point converter?	[3M]
	d)	Write the firing angle ranges of dual converters in four quadrants.	[4M]
	e)	A DC chopper operates on 230 V dc and frequency of 400 Hz, feeds R-L load. Determine the on time of the chopper for output of 150 V.	[4M]
	f)	Explain about unipolar switching in single phase bridge inverters.	[4 M]

PART –B

2	a)	Explain the diode bridge rectifier with R load and capacitive filter with neat circuit diagram and necessary waveforms. Deduce the expression for ripple factor.	[10M]
	b)	Explain the static characteristics of thyristor with neat diagrams.	[6M]
3	a)	A single phase half-wave controlled converter is operated from 230 V, 50 Hz supply. Load resistance R= 15 Ω. If the average output voltage is 35% of the maximum possible average output voltage, determine: (a) firing angle (b) rms and average output currents (c) average and rms SCR currents	[8M]
	b)	Why the firing angle in single phase ac voltage controller should be more than load phase angle explain with neat circuit and waveforms?	[8M]
4	a)	Explain the operation of single phase fully controlled converter feeding RLE load with neat circuit diagram and waveforms also deduce the rms output voltage.	[8M]
	b)	A single phase semiconverter, connected from 230 V, 50 Hz source, is feeding a load R= 15 Ω in series with a large inductance that makes the load current ripple free. For a firing angle 60°, calculate the input and output performance parameters of this converter.	[8M]
5		Explain the operation of three phase circulating current type dual converter and obtain the expression for peak value of circulating current. Draw the relevant voltage and current waveforms.	[16M]

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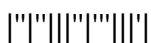
6   a)   Discuss the working of a single phase bridge type cycloconverter with RL loads and for discontinuous waveform operation with neat circuit diagram. Draw the output voltage and current wave forms for $f_O = (1/3)$ fs, where f_S is input frequency and f_O is the output frequency.   [8M]

    b)   Explain the operation of Buck-Boost converter with relevant waveforms and derive the expression for average output voltage.   [8M]

7   a)   With a neat circuit diagram, explain the principle of operation of a single phase full bridge inverter feeding RL load.   [6M]

    b)   Explain the operation of three-phase bridge inverter with 180° mode of operation with aid of relevant phase and line voltage waveforms.   [10M]

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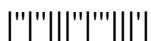
III B. Tech I Semester Supplementary Examinations, October/November - 2018
THERMAL ENGINEERING – II
(Mechanical Engineering)

Time: 3 hours   Max. Marks: 70
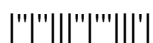
Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
(Use of steam tables and Mollier chart is allowed)
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PART –A

1 a) What do you understand by mean temperature of heat addition?   [4M]

   b) Explain `Boiler Draught`?   [3M]

   c) Explain the principle involved in calculation of the velocity with which fluid issues [4M]
       from a nozzle assuming frictionless adiabatic flow.

   d) Differentiate between Impulse and Reaction turbines.   [4M]

   e) Discuss the relative advantages and disadvantages of reciprocating I.C. engines and gas [3M]
       turbines.

   f) What is meant by thrust augmentation? Explain. When it is necessary?   [4M]
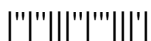
PART -B

2 a) What is adiabatic flame temperature? How flame temperature can be calculated?   [7M]

   b) A power generating plant uses steam as a working fluid and operates at a boiler   [9M]
       pressure of 80 bar and a condenser pressure of 0.075 bar. Assuming the operating cycle
       to be ideal, determine i) The heat transfer per unit mass of steam in the boiler and
       condenser; ii) The specific work output; iii) The cycle efficiency; iv) The required rate
       of steam flow to provide a specified power output of 10000 kW and v) Work ratio if
       the plant operates on The Rankine cycle, taking the pumping work into account.

3 a) What do you mean by high pressure boilers? How do they differ in construction and   [7M]
       working from an ordinary boiler?

   b) Describe briefly the advantages which you would expect to be gained from   [9M]
       incorporating economizer, air pre-heater and a super heater in a steam plant. By a line
       diagram, indicate the position of these accessories in a typical boiler plant.

4 a) Describe the changes which occur in pressure and velocity distribution along the length [8M]
       of a i) convergent nozzle ii) convergent-divergent nozzle, as the back pressure is
       reduced slowly from inlet pressure to below designed back pressure.

   b) Find the optimum ratio of blade speed to steam speed for a two-stage velocity-   [8M]
       compounded impulse turbine. How diagram efficiency varies with blade-steam
       velocity ratio with the increase in number of stages?

5 a) Explain the working of a single-stage reaction turbine. Sketch pressure and velocity   [8M]
       variations along the axis of the turbine. Show the expansion on h-s chart.

   b) The vacuum at the bottom of a surface condenser is 65.4 cm of mercury (barometer   [8M]
       75.7cm), the temperature at the air pump suction is 36.2^{0}C. If the rate of air leakage
       into the condenser is 1kg per 1000 kg of steam, estimate the mass of air and vapour
       removed by the air pump per minute when the engine consumption is 136000 kg of
       steam/hr.

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6　a)　Show with a sketch that closed cycle gas turbine plant is similar to steam turbine plant.　[8M]

　　b)　Discuss about types of gas turbine combustion chambers.　[8M]

7　a)　Describe with a sketch a solid propellant rocket. What is gain? What are the applications of solid propellant rockets?　[8M]

　　b)　The effective jet exit velocity of a rocket is 3500 m/s, the forward flight velocity is 1250 m/s, and the propellant consumption is 75 kg/s. Calculate: i) The thrust; ii) The thrust power and iii) The propulsive efficiency.　[8M]

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2 of 2

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SET - 1

III B. Tech I Semester Supplementary Examinations, October/November - 2018
ANTENNA AND WAVE PROPAGATION
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **Three** Questions from **Part-B**

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PART –A

1.	a)	Estimate radiation intensity if power density is $A_o \sin\theta$?	[3M]
	b)	Estimate the retarded time in antenna field propagation at a radial distance 6λ?	[3M]
	c)	Draw the configuration of 16 elements in linear, planar and circular Array structure?	[4M]
	d)	Define resonant and non-resonant radiators?	[4M]
	e)	Discuss about importance of F/D ratio in parabolic antenna?	[4M]
	f)	Define path loss in FRIIS Transmission formula?	[4M]

PART -B

2.	a)	Explain the working principle of a single wire antenna?	[8M]
	b)	Define effective height (h_{eff}) of an antenna? Discuss h_{eff} for half wave Dipole and short dipole antenna?	[8M]
3.	a)	Using basic equations, prove that R_{rad} of a half wave dipole is 73Ω?	[8M]
	b)	Find the radiation resistance of a loop antenna(i) single turn (ii) Number of turns =10 of diameter 0.5 m and operating at 1 MHz .	[8M]
4.	a)	Derive the array factor of N-element isotropic linear uniform distributed Antenna?	[8M]
	b)	An array contains 10 isotropic radiators with an inter element spacing of 0.5λ. It is required to produce broadside and end-fire beams i) Find Null-to-Null beam width and half-power beam width in degrees. ii) Find the directivity of both forms of arrays.	[8M]
5.	a)	Design and explain the working principle of a microstrip antenna?	[8M]
	b)	Explain the working principle of a helical antenna in normal mode?	[8M]
6.	a)	List out different types of Familiar reflector antennas? Explain any one of the antenna?	[8M]
	b)	Explain the Gain Measurement 3-antenna method?	[8M]
7.	a)	A transmitter operating at a frequency of 2 MHz is required to provide a ground wave field strength of 0.5 mV/m at a distance 10 km. A short Vertical transmitting antenna has an efficiency of 50% .The conductivity of the ground is 5×10^{-5} (mho) / cm and its relative permittivity is 10. Find the transmitter power required.	[8M]
	b)	Derive the LOS distance in space wave propagation?	[8M]

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SET - 1
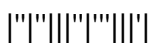
III B. Tech I Semester Supplementary Examinations, October/November- 2018
OPERATING SYSTEMS
(Common to Computer Science Engineering and Information Technology)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1	a)	Mention the objectives and functions of an operating system.	[3M]
	b)	Define preemption and nonpreemption.	[4M]
	c)	What is Semaphore? Mention its properties.	[4M]
	d)	List the steps needed for page replacement.	[4M]
	e)	What is deadlock? What are the schemes used in operating system to handle deadlocks?	[3M]
	f)	What are the various file accessing methods?	[4M]

PART -B

2	a)	Explain the operating system structure and its functions.	[8M]
	b)	Briefly Explain the different types of systems: parallel systems, distributed systems and real-time systems?	[8M]
3	a)	Explain the steps involved in process creation and process termination.	[8M]
	b)	Demonstrate FIFO and Round Robin CPU scheduling algorithms with suitable example.	[8M]
4	a)	What is the critical section? What are the minimum requirements that should be satisfied by a solution to critical section problem?	[8M]
	b)	Give a solution for readers-writers problem using conditional critical regions?	[8M]
5	a)	Explain the concept of demand paging in detail with neat diagrams.	[8M]
	b)	Given memory partition of 100 KB, 500 KB, 200 KB and 600 KB (in order). Show with neat sketch how would each of the first-fit, best-fit and worst fit algorithms place processes of 412 KB, 317 KB, 112 KB and 326 KB (in order).	[8M]
6	a)	Explain the techniques used to prevent the deadlocks.	[8M]
	b)	Explain Banker's deadlock-avoidance algorithm with an illustration.	[8M]
7	a)	Discuss the different file allocation methods with suitable example.	[8M]
	b)	Compare and contrast free space management and swap space management.	[8M]

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Code No: **R31045**

R10

Set No. 1

III B.Tech I Semester Supplementary Examinations, October/November- 2018
ANTENNAS AND WAVE PROPAGATION
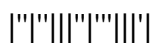**(Electronics and Communication Engineering)**

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
*****

1 a) Explain the following terms: [9M]
       i) Antenna effective height   ii) Antenna aperture
       iii) Current distribution on a thin wire antenna
   b) An antenna has a radiation resistance of 72Ω, a loss resistance of 8Ω and a power [6M]
       gain of 12 dB. Determine the antenna efficiency and its directivity.

2 a) Define radiation resistance of an antenna. Calculate the radiation resistance of a $\lambda/10$ [8M]
       wire dipole in free space.
   b) Explain the concept of short magnetic dipole. [7M]

3 a) Discuss the conditions under which an array of antenna will behave either as a [7M]
       broadside array or an end fire array.
   b) A uniform linear array consisting of 16 isotropic point sources with a spacing of $\lambda/4$. [8M]
       If the phase difference is equal to -90^0. Calculate
       i) HPBW   ii) Beam solid angle   iii) Beam efficiency   iv) Directivity

4 a) Explain the radiation mechanism in travelling wave radiator. [8M]
   b) Discuss the basic properties of helical antennas. [7M]

5 a) With a neat sketch explain the principle of operation of 3 element Yagi-Uda antenna. [9M]
   b) A parabolic dish provides a gain of 75 dB at a frequency of 15 GHz. Calculate the [6M]
       capture area of the antenna, its 3dB and null beam widths.

6 a) Explain the principle of operation of Lens antenna with neat sketches. [9M]
   b) Explain the procedure for measuring the Directivity of an antenna. [6M]

7 a) Explain the following: [9M]
       i) MUF   ii) Wave Tilt   iii) Critical frequency
   b) Communication by ionosphere propagation is required for a distance of 200Km. [6M]
       Height of the layer is 220Km and critical frequency is 5MHz. Find MUF.

8 a) Explain the mechanism by which the space wave propagates. What is meant by radio [9M]
       horizon?
   b) Write a brief note on Space wave Propagation and its mechanism. [6M]

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Code No: **R31055**

R10

Set No. 1

III B.Tech I Semester Supplementary Examinations, October/November - 2018
MICROPROCESSORS AND MULTICORE SYSTEMS
(Computer Science and Engineering)

Time: 3 hours

Max. Marks: 75

Answer any FIVE Questions
All Questions carry equal marks
*****

1	a)	What is a microprocessor? What are different types of microprocessors? Also explain the evolution of microprocessors.	[8M]
	b)	Briefly discuss about the execution of a three instruction program.	[7M]
2		With the help of suitable examples, explain the implementation of if-then, if-then-else and multiple if-then-else programs in assembly language.	[15M]
3	a)	Define macro? Explain how macro is different from procedure?	[7M]
	b)	Explain the functions of the following instructions of 8086 with examples. i) MOVSW ii) CMPS iii) LODS iv) REP	[8M]
4	a)	Explain the functions of DB, DT, ENDP, EQU, LENGTH assembler directive.	[7M]
	b)	What is MASM? Explain.	[8M]
5	a)	List and explain the different interrupts of 8086 microprocessor.	[7M]
	b)	Explain interrupt structure of 8086 microprocessor.	[8M]
6	a)	Write an assembly language program in 8086 to convert a four digit octal number to decimal number.	[8M]
	b)	Write a program to move a string of data words from offset 2000H to offset 3000H. The length of the string is 10H.	[7M]
7	a)	Explain the internal architecture of 80286 with suitable diagram.	[8M]
	b)	List out the salient features of the 80286 microprocessor?	[7M]
8	a)	Explain the salient features of Pentium processor. Also explain the memory system of the Pentium processor.	[7M]
	b)	Differentiate between Dual core and Core Duo processors.	[8M]

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